DOCUMENT RESUME

ED 406 654 CS 012 794

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TITLE Self-Regulation of Reading College Textbooks.
PUB DATE Mar 97
NOTE 16p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 24-28, 1997).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Critical Reading; Higher Education; Learning Strategies; Metacognition; Reading Research; *Reading Strategies; Study Habits; *Study Skills; Undergraduate Students
IDENTIFIERS *Self Regulated Learning

ABSTRACT

Models of self-regulated learning describe learners as actively and mindfully employing cognitive and metacognitive strategies as they pursue their learning goals. Self-regulated learners set goals, plan, and use a variety of cognitive strategies, monitor progress towards their goals, and manage their emotional states. However, many classroom teachers observe students who use passive study techniques or who apply simple strategies. To examine the level of self-regulation as students read their textbooks in preparation for classroom examination, students were surveyed after each exam in two college classes. In one course (Psychological Testing), students (n=27) read their texts only immediately before the tests and used shallow study tactics (such as highlighting). Across the semester, the quality of study strategies decreased slightly, but students also increased their efforts. Test scores improved significantly. Relatively strong correlations emerged between studying and test performance, supporting the notion that strategies do indeed work for students who use them. Like the Testing class, the Educational Psychology students (n=34) initially used shallow tactics and read their text only prior to the test. Unlike the Testing class, the level of effort was constant across the semester, but the quality of strategies used improved significantly (trying tactics such as concept maps and peer questioning). At the same time, test scores dropped across the semester and weak correlations were found between studying and test performance. This may be the result of insufficient practice with the new techniques, or insufficient effort in using these strategies. (Contains 11 references and 3 tables of data.) (Author/RS)

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RUNNING HEAD: Self-regulation of Reading

Self-Regulation of Reading College Textbooks

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ABSTRACT

Models of self-regulated learning describe learners as actively and mindfully employing cognitive and metacognitive strategies as they pursue their learning goals. Self-regulated learners set goals, plan, use a variety of cognitive strategies, monitor progress towards their goals, and manage their emotional states. However, many classroom teachers observe students who use relatively shallow and passive study techniques or who routinely apply simple strategies in rather mindless ways. To examine the level of self-regulation as students read their textbooks in preparation for classroom examinations, students were surveyed after each exam in two college classes. In one course (Psychological Testing), students read their texts only immediately before the tests and used shallow study tactics (such as highlighting). Across the semester, the quality of study strategies decreased slightly, but students also increased their efforts. Test scores improved significantly. Relatively strong correlations emerged between studying and test performance, supporting the notion that strategies do indeed work for students who use them. Like the Testing class, the Educational Psychology students initially used shallow tactics and read their text only prior to the test. Unlike the Testing class, the level of effort was constant across the semester, but the quality of strategies used improved significantly (trying tactics such as concept maps and peer questioning). At the same time, test scores dropped across the semester and weak correlations were found between studying and test performance. This "labor in vain" may be the result of insufficient practice with the new techniques, or insufficient effort in using these strategies.

Self-Regulation of Reading College Textbooks

Expert learners, as described in models of self-regulation (e.g., Butler & Winne,1995; Pressley & Afflerbach, 1995; Winne, 1995; Zimmerman, B. J., 1994) possess three important characteristics. First, they actively control their own learning by employing a range of cognitive strategies that assist in the construction of meaning and retention of information. Second, they are mindful, using metacognitive strategies such as planning and monitoring to control their own progress towards their instructional goals. Finally, they are intrinsically motivated, focused upon the task at hand, and thoughtfully control emotional difficulties.

While these models describe the capabilities of experts (see Wyatt, Pressley, El-Dinary, Stein, Evans, & Brown, 1993 for a description of professors reading articles in their area of specialization) under the microscope of "think aloud" experimental conditions, how well do they describe the everyday reading and studying people do? There are several reasons students use less-than-optimal strategies. One is a lack of motivation (Rothkopf, 1988). Strategies require deliberate effort and are time-consuming. The cost of self-regulation, especially for novices in the early phases of learning, may be too high (Winne, 1995). A second factor is lack of prior knowledge. Experts generally engage in domain-specific strategies (see Ericsson & Lehmann, 1996 for a review), and if students are novices in the area of study, they may be incapable of

sophisticated strategy usage. A third factor is competing demands on students' time (other courses, work, families, social events, personal problems) and energy may prevent students from performing at optimal levels (Barnett, 1996). Finally, students may deliberately engage in less-than-optimal behavior by a professor's standards, but may be highly self-regulating in terms of their own goals (Nolen, 1996). For example, students may have set a goal of simply passing a course and determined that this goal can be achieved without even reading the text. For reasons such as these, I suspect that researchers may be describing an idealized, strategic learner that teachers rarely see.

To investigate this question, Barnett (1996) compared performance on quizzes to self-reported studying across a series of required "outside reading" assignments in college courses. This study found little evidence for self-regulation. Rather, students were very consistent in their study tactics, using the same ones despite less-than-optimal quiz performance. Skimming (not reading) the articles prior to class or reading and highlighting were commonly reported. Deeper learning strategies, such as outlining or generating questions, were rarely used. Students did not change their approach even though a majority of students scored between 40% and 60% on the quizzes.

The present study replicates the Barnett study and extends it by examining textbook readings as preparation for in-class examinations.

Students should be more motivated to read and study these assignments, as they counted for a large portion of the students' course grades. Further, these major course exams are scheduled well in advance, so situational factors (e.g., work schedules and other course demands) should play less of a role. Finally, students receive explicit feedback on the tests and expect similar test items in the future, including a comprehensive final. This classroom study should provide an optimal situation for student self-regulation. Evidence for self-regulation would be found if students adjust their effort and strategies across the course of a semester, using performance on tests early in the semester as a guide for preparing for later examinations.

Methods

Participants

Sixty-one students from two college courses participated in this study. Twenty-seven students (18 female, one minority student) in an Educational Psychology course and thirty-four students (24 female, 2 minority students) in a Psychological Testing class were surveyed about their use of their textbooks in preparation for regularly scheduled classroom examinations. The Educational Psychology course is required of all education majors, is usually in the sophomore year, and is typically their first college psychology course. It . The Psychological Testing course is required of all psychology majors and minors and is typically a

third or fourth course in the field. Most of the students are sophomores and juniors.

Procedures

As part of the regular course requirements, textbook chapters were assigned and students were tested over information in those chapters. The exams were a combination of multiple choice and essay questions, covering material from lectures and activities as well as the text. For the purposes of this study, only items measuring text material not explicitly covered in class were included. In the Educational Psychology course, three exams were administered with five or six chapters assigned per test. In the Psychological Testing class, four exams were administered, with approximately 3 chapters per test.

Students completed the studying survey at the beginning of the class immediately following each test (prior to any performance feedback). For each assigned chapter, students rated when they read the chapters (never, concurrently with scheduled lectures, just prior to the test, or both concurrently with lectures and again before the test) and how thoroughly they studied each chapter (not at all, skimmed the chapter, read the chapter, read and studied the chapter). Students were also asked to describe their strategies for studying the text materials.

Early in the semester, the instructor briefly described this research project and solicited student participation. To insure confidentiality,

students used a code number and all study surveys were handled by a graduate assistant. All students signed consent forms and received extra credit towards their final grade for their participation.

Scoring

All tests were scored by their regular instructor. After the semester, scores were recalculated using only items based upon text information, but maintaining the instructor's scoring. Since students were highly consistently across chapters within a testing period, scores were collapsed into three categories: when students studied, how much they studied, and their use of strategies. The "when" scores produced so little variation (with the vast majority reading the text just prior to the test) that no comparisons can be made. The "how much" questions were scored on a rating scale of 1 to 4, where 1 was labeled as "did not read the chapter," a 2 was "skimmed the chapter," a 3 was "read the chapter" and a 4 was "read and studied" the chapter. Finally, written responses to the question of "how" they studied for the test were scored on a scale of 1 to 5, where a 1 implies "didn't study," low scores (2-3) imply shallow, rote types of strategies and tactics (underlining important ideas or key terms was scored a 2), and high scores (4-5) were assigned to deeper, more meaningful kinds of studying (making a concept map for a chapter was scored a 4, making a concept map and then having a classmate test her over the items in her concept map was scored a 5). Two scorers, trained

in scoring by the author, agreed in 94% of all scores. In cases of disagreement, the author rescored the student response.

Results

In each class, the data were analyzed as follows. First, correlations between the ratings from the studying survey and test scores were calculated to examine the relationship between studying and achievement. Second, ANOVAs were used to test changes in studying and test performance across the semester.

Psychological Testing Class

As you can see in Table 1, significant correlations were found between achievement and the amount of studying on Test 2, 3, and 4, but not on Tests 1. In the Testing class, the correlations between achievement and the quality of studying were also significant on all tests but the first one. Obviously, this supports the role of hard work and good strategies in academic achievement.

The ANOVA on amount of studying across the semester showed significant changes, $F(3, 99)=6.46$, $p=.001$. Follow-up tests revealed that students studied the text more for Tests 2 and 4 than Tests 1 and 3. Student self-reports of the quality of studying did not change significantly across the semester, $F(3, 99)=2.14$, $p=.10$. Finally, test performance improved across the semester, $F(3, 99)=13.11$, $p<.001$. Follow-up tests revealed that scores increased consistently across all 4

tests, from a low of 30% on Test 1 to 57% on Test 4.

Educational Psychology Class

In the Educational Psychology class, weak and nonsignificant correlations between achievement and the amount of studying. Only for Test 2 did the correlation reach significance. The correlations between achievement and the quality of studying show the same pattern. The amount of studying did not change across the semester, $F<1$. The quality of studying did change, however, $F(2, 80)=11.96$, $p=.001$. Follow-up tests found that students received significant higher ratings across the semester. Achievement did vary across tests, $F(2, 86)=25.39$, $p<.001$. Post hoc tests found scores were highest on Test 1 (M=59%), significantly lower on Test 3 (M=48%) and worst on Test 2 (M=39%).

Discussion

The data from the Psychological Testing are generally consistent with the notion of self-regulation. Student effort was correlated with test achievement. Effort generally increased across the semester and this effort was reflected in higher test scores. The quality of studying was consistent across the semester and the correlations between quality and test scores increased across the semester. This suggests that students using good strategies were using more effort and making minor adjustments in their studying. It is important to note that these are students taking a course in their major and that this course is typically

taken after several other courses, so the students are familiar with texts, tests, and studying in Psychology classes.

The Educational Psychology class showed a different pattern of results, with no evidence of successful self-regulation. Correlations between effort and quality of studying with achievement were consistently low and did not vary across the semester. Effort did not change despite poor performance. The quality of studying increased, but did not result in improved performance. Why this "labor in vain" (Nelson & Leonescio, 1988) occurred is unclear. Their surveys suggest that these students were generally attempting to use strategies taught as part of their Educational Psychology course. Why did these attempts fail? One possibility is that the students did not increase the effort required for strategies to be successful (Winne, 1995). A second possibility is that students lacked the background knowledge to make the strategy work. According to Pressley (1995), real self-regulation requires a high level of domain-specific knowledge. It is unlikely that students in a first course in a field could show much self-regulation. This finding suggest that greater care needs to be taken in the strategies that we teach students and in how we teach these strategies.

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Table 1

Correlations between study strategies and performance on the class examinations in two college classes

	amount of study	quality of studying
Educational Psych		
Test 1	.26	.19
Test 2	.40 *	.40 *
Test 3	.23	.23
Psych Testing		
Test 1	.05	.05
Test 2	.49 **	.35 *
Test 3	.59 **	.51 **
Test 4	.61 **	.45 **

* $p<.05$

** $p<.01$

Table 2
Self-reported studying and test performance across the semester in Equational Psychology

	Amount of Studying	Quality of Studying	Test Score (percentages)
Test 1			
M	2.25	2.54	.58
s	.84	1.11	.12
Test 2			
M	2.30	3.00	.39
s	.91	1.44	.12
Test 3			
M	2.40	3.59	.48
s	.89	1.34	.11

Table 3

Self-reported studying and test performance across the semester in Equational Psychology

	Amount of Studying	Quality of Studying	Test Score (percentages)
Test 1			
M	2.31	3.27	.30
s	.71	1.17	.16
Test 2			
M	2.88	3.40	.41
s	.86	1.28	.19
Test 3			
M	2.52	2.72	.46
s	.90	1.33	.25
Test 4			
M	3.15	2.77	.57
s	1.13	.99	.24